Math 307 Week 1 Newsletter – Dr. Loveless

Every Friday, I will email the class or post a newsletter. These newsletters and emails will contain a summary of the calendar, information about homework, links to review material and studying advice. The studying advice will include old exam problems to look at each week. **It is vital that you spend some time each week reviewing homework and practice your homework stills on similar old exam problems**. If you find something helpful here, please advertise to your classmates.

UPCOMING SCHEDULE:

Friday:	Test Prep 1, Section 1.1-1.3 (application and motivation)
Monday:	Section 1.3, 2.2 (slope fields and separable differential equations)
Wednesday:	Section 2.2, 2.1 (separable and integrating factors)
Next Friday:	Section 2.1, 2.3 (integrating factors and applications)

HOMEWORK: Closing Monday, HW1 (1.1-1.2), Closing next Friday, HW2 (1.3, 2.2)

NEW POSTING:

I will be creating many new postings each week, please take some time to look at them to see if they will help you. Here is the course website: http://www.math.washington.edu/~aloveles/Math307Fall2019/index.html
These are all original review sheets written by me. I have just written some of these so beware of typos (but I have gone through a couple edits so hopefully I caught most the typing errors).

1. **Integration!** You need to know integration well for this course. Especially integration by parts and partial fractions.
   Full review of Integration by Parts (Check this out!)
   http://www.math.washington.edu/~aloveles/Math307Fall2019/m307LaplaceIntegrationFacts.pdf
   Full review of Partial Fractions (Check this out!):
   http://www.math.washington.edu/~aloveles/Math307Fall2019/m307PartialFractions.pdf
   Several basic examples:
   http://www.math.washington.edu/~aloveles/Math307Fall2019/m307BasicIntegrationExamples.pdf
   Overview of all integration methods (From my Math 125 class):
   http://www.math.washington.edu/~aloveles/Math307Fall2019/IntegrationTechniques.pdf
   Flowchart on how to do any integral (From my Math 125 class):
   http://www.math.washington.edu/~aloveles/Math307Fall2019/IntegrationTechniques2.pdf
2. **Chapter 1 Overview:**
   https://sites.math.washington.edu/~aloveles/Math307Fall2019/m307Chapter1Review.pdf
3. **Complete summary of section 2.2 (separation of variables). Contains four fully worked out additional examples**. The last page is about change of variable which we don't emphasize (just for your own interest).
   http://www.math.washington.edu/~aloveles/Math307Fall2019/m307Review2-2.pdf

General Advice:

Exam 1 is essentially about four things:

1. Solving 1st order equations (separable, integrating factor)
2. Setting up some basic applied problems (like you do in chapter 1 and will do in 2.3)
3. Analyzing first order equations: a bit of theory, slope fields, equilibrium and terminology.
4. Numerical approximation of solutions (Euler's Method)

Before we get into application, theory and analysis, you first need to be comfortable with solving (sections 2.2 and 2.1). Do more than just the homework. Do extra problems from the book. Do the problems mentioned above. Do more problems from other old exams. In this way, you can take care of getting good at solving. Once you can solve, then we spend a lot of energy on setting up applications and analysis (which we will be doing next week).

See the next page for old exam practice!!!

OLD EXAMS:
Most weeks, I will also include in this newsletter several links to old exams just to encourage you to start accessing yourself on how ready you are for the exam. There are many old exams that I have personally compiled (most with solutions) in my personal Math 307 exam archive here:
http://www.math.washington.edu/~aloveles/Math307Fall2019/examarchive.html
And here is the Math 307 Exam 1 Archive: https://sites.math.washington.edu/~m307/midterm1.php
Here is some targeted practice on the current material:

Practice for chapter 1 (Direction Fields):
Problem 1(e): https://sites.math.washington.edu/~m307/midterm1/m2018/midone05.pdf
And see homework!!!

Practice for chapter (Set-Up Applications):
Populations/Savings Accounts:
Problems 1(a) and 5: https://sites.math.washington.edu/~m307/midterm1/m2018/midone05.pdf
Problem 5: https://sites.math.washington.edu/~m307/midterm1/m2015/midone1.pdf
Problem 5 from: http://www.math.washington.edu/~aloveles/Math307Spring2016/sp15m307e1.pdf
Problem 5 from: http://www.math.washington.edu/~aloveles/Math307Spring2016/midterm1.pdf
Mixing Problems:
Problem 5: https://sites.math.washington.edu/~m307/midterm1/m2018/midone05.pdf
Problem 3b: https://sites.math.washington.edu/~m307/midterm1/m2015/midone1.pdf
Problem 3b from: http://www.math.washington.edu/~aloveles/Math307Spring2016/sp15m307e1.pdf
Problem 3 from: http://www.math.washington.edu/~aloveles/Math307Spring2016/midterm1f.pdf
Problem 3a from: http://www.math.washington.edu/~aloveles/Math307Spring2016/midterm1h.pdf
Velocity:
Problem 4 from: http://www.math.washington.edu/~aloveles/Math307Spring2016/midterm1g.pdf
Problem 5 from: http://www.math.washington.edu/~aloveles/Math307Spring2016/midterm1f.pdf
Problem 4 from: http://www.math.washington.edu/~aloveles/Math307Spring2016/midterm1e.pdf
Newton's Law of cooling:
Problem 5: https://sites.math.washington.edu/~m307/midterm1/m2018/midone02.pdf
Other:
Problem 4 from: http://www.math.washington.edu/~aloveles/Math307Spring2016/sp15m307e1.pdf
Problem 5 from: http://www.math.washington.edu/~aloveles/Math307Spring2016/midterm1g.pdf

Practice for 2.2 (Separable Equations):
Problem 1(a): http://www.math.washington.edu/~aloveles/Math307Fall2019/sp15m307e1.pdf
Problem 1: http://www.math.washington.edu/~aloveles/Math307Fall2019/midterm_1_wi14_spicer.pdf
Problem 2: https://sites.math.washington.edu/~m307/midterm1/m2018/midone01.pdf
Problem 1(a): http://www.math.washington.edu/~aloveles/Math307Fall2019/midterm1h.pdf
Problem 1: http://www.math.washington.edu/~aloveles/Math307Fall2019/midterm1f.pdf

I hope this helps!

Dr. Andy Loveless